

CHAPTER 1

INTRODUCTION

At this stage in your naval career, you are well aware that training on a continuous basis is essential if you are to reach your desired goals, and if the mission of the Navy is to be successfully accomplished. The purpose of this manual is to serve as one of many sources of information as you continue your training to become proficient in the tasks you will be required to perform at the E-6 and E-7 levels of your rating. A knowledge of the information in this manual, combined with the everyday practical experience, should help you learn to perform assigned tasks and accept greater responsibilities.

RESPONSIBILITIES AND REWARDS

As you attain each higher promotional level in your rating, you, as well as the Navy, benefit. The fact that you are using this training manual indicates that you have found personal satisfaction in developing your skills, increasing your knowledge, and getting ahead in your chosen career. The Navy has benefited, and will continue to do so as you become more valuable as a technical specialist in your rating and as a person who can supervise and train others, thus making far reaching and long lasting contributions to the success of the Navy.

In large measure, the extent of your contribution to the Navy depends upon your willingness and ability to accept increasing responsibilities as you advance. When you assumed the duties of an EN3, the Navy rewarded you with an increase in pay and responsibility, a responsibility not only for yourself but for the work of others. With each advancement, you accept an increasing responsibility in military matters and in matters relating

to the occupational requirements of the Engineman rating.

You will find that your responsibilities for military leadership are about the same as those of petty officers in other ratings, since every petty officer is a military person as well as a technical specialist. Your responsibilities for technical leadership are specific to your rating and are directly related to the nature of your work. Operating and maintaining the machinery and equipment for which an Engineman is responsible is a job of vital importance. It is a teamwork job which requires that special kind of supervisory ability that can only be developed by personnel who have a high degree of technical competence and a deep sense of personal responsibility.

Certain practical details that relate to your responsibilities for administration, supervision, and training are discussed in subsequent chapters of this training manual. At this point, let's consider some of the broader aspects of your ever increasing responsibilities for military and technical leadership.

YOUR RESPONSIBILITIES WILL EXTEND BOTH UPWARD AND DOWNWARD. Officers and Supervisors will expect you to carry out their orders. Enlisted personnel will expect you to translate the general orders given by officers into detailed, practical on-the-job language that can be understood and followed even by relatively inexperienced personnel. In dealing with your juniors, it is up to you to see that they perform their work properly. At the same time, you must be able to explain to officers any important needs or problems pertaining to the enlisted personnel.

YOU WILL HAVE REGULAR AND CONTINUING RESPONSIBILITIES FOR TRAINING. Even if you are fortunate enough to have

a highly skilled and well trained group, you will still find that additional training is necessary. For example, you will always be responsible for training lower rated personnel to perform their assigned tasks. Occasionally, some of your best workers may be transferred and replaced by inexperienced or poorly trained personnel. Also, some particular job may call for skills that none of your personnel have. These and similar problems will require you to be a training specialist who can train individuals and groups in the effective execution of assigned tasks.

YOU WILL HAVE INCREASING RESPONSIBILITIES FOR WORKING WITH OTHERS. You will find that many of your plans and decisions affect a large number of people, some of whom are not in your division and some of whom are not even in the engineering department. It becomes increasingly important, therefore, to understand the duties and responsibilities of personnel in other ratings. Every petty officer in the Navy is a technical specialist in his/her own field. Learn as much as you can about the work of other ratings, and plan your own work so that it will fit in with the overall mission of the organization.

AS YOUR RESPONSIBILITIES INCREASE, YOUR ABILITY TO COMMUNICATE CLEARLY AND EFFECTIVELY MUST ALSO INCREASE. The basic requirement for effective communication is a knowledge of your own language. Use correct language in speaking and in writing. Remember that the basic function of all communication is understanding. To lead, supervise, and train others, you must be able to speak and write in such a way that others can understand exactly what you mean. You must be able to convey information accurately, simply, and clearly.

A second requirement for effective communication in the Navy is a sound knowledge of the Navy way of saying things. Some Navy terms have been standardized for the purpose of ensuring efficient communication. When a situation calls for the use of standard Navy terminology, use it.

Still another requirement for effective communication is precision in the use of technical terms. Command of the technical language of the

Engineman rating will enable you to exchange ideas with other personnel of the same rating. Personnel who do not understand the precise meaning of terms used in connection with the work of their own rating are at a disadvantage when they try to read official publications relating to their work. They are also at a great disadvantage when taking written examinations for advancement. Although it is always important to use technical terms correctly, it is particularly important when you are dealing with lower rated personnel. Sloppiness in the use of technical terms may be extremely confusing and frustrating to an inexperienced person.

YOU WILL HAVE INCREASED RESPONSIBILITIES FOR KEEPING UP WITH NEW DEVELOPMENTS. Practically everything in the Navy—policies, procedures, equipment, publications, systems—is subject to change and development. As an EN1, and even more as an ENC, you must keep yourself informed about all changes and new developments that might affect your rating or your work.

Some changes will be called directly to your attention; others you will have to look for. Try to develop a special kind of alertness for new information. Keep up to date on all sources of technical information. Information on sources of primary concern to the Engineman is given later in this chapter.

As you prepare to assume increased responsibilities at a higher level, you need to be familiar with (1) the military requirements and occupational standards given in the *Navy Enlisted Manpower and Personnel Classifications and Occupational Standards*, NAVPERS 18068 (with changes); (2) the Personnel Advancement Requirement (PAR), NAVPERS 1414/4; (3) appropriate rate training manuals; and (4) any other material that may be required or recommended in the most current edition of the *Bibliography for Advancement Examination Study*, NAVEDTRA 10052. These materials and their use are discussed more thoroughly in *Military Requirements for Petty Officers 1 & C*, NAVEDTRA 10057 (current edition), and *Engineman 3 & 2*, NAVEDTRA 10541 (current edition). Other sources of information will be described later in this chapter.

THE ENGINEMAN—YOUR JOB

Since you first became a rated person you have mastered basic skills, became familiar with much of the terminology applicable to internal combustion engines and other equipment, and learned to answer many of the technical questions asked by lower rated personnel. Along with this increase in knowledge, you have gradually assumed greater responsibilities. The rate for which you are now preparing demands more knowledge and skill, a willingness to assume greater responsibility, and the ability to lead people.

As an EN1 or ENC, you must be familiar with all the functions of the engineering department and be proficient in a wide variety of tasks. Your duties will include using proper procedures for troubleshooting, maintenance and repair, planning, organizing, and carrying out the work involved in these procedures. You will maintain records and submit reports; you will supervise the stowage of supplies and repair parts; and you will take an active part in the training of lower rated personnel. In brief, you will be a technical specialist and a military leader.

MILITARY DUTIES AND RESPONSIBILITIES

Information related to the military requirements for advancement is included in training manuals specifically prepared to cover such requirements. These manuals are listed and described briefly later in this chapter.

TECHNICAL DUTIES AND RESPONSIBILITIES

A petty officer must become a technical specialist in his/her rating. Technical duties which an Engineman must learn to perform efficiently include:

1. Operating internal combustion engines and auxiliary engineroom machinery.
2. Maintaining internal combustion engines and related accessories and equipment.

3. Performing overhaul and repair work on internal combustion engines, using established procedures for disassembly, replacement, and reassembly.

4. Conducting routine tests and inspections of all engineroom machinery.

5. Operating and making repairs to auxiliary boilers and to refrigeration, air conditioning, and distilling systems.

6. Using lathes and other machine shop equipment.

7. Using measuring instruments needed in engine overhaul, such as micrometers, feeler gages, and inside and outside calipers.

8. Reading accurately such instruments as thermometers, pressure gages, and pressure indicators.

Probably you can already do many of these jobs. Others you will have to learn from additional practical experience and through study. Although you will be learning many new jobs as an EN1, and especially as a ENC, you will be concerned principally with directing and observing the work of personnel assigned to you. You will be responsible for their performance and their training in all of the jobs required of an Engineman.

In addition to the duties already mentioned, you will compile necessary data for the preparation of engineering reports and records. It will be your duty to make frequent tours of assigned spaces, and to inspect equipment for proper operation. You will check the auxiliary watch for performance of duty in accordance with standing orders. You will be responsible for the use of the correct operating procedure for all equipment under your jurisdiction. You will be accountable for daily routine inspections, tests, and reports on all equipment that require daily maintenance and testing.

You may be held responsible to the division officer for the proper setting and standing of all watches during your duty period. You may be required to post the daily watch list in the engineroom and may be responsible for instructing and training watchstanders in their duties.

You will instruct lower rated personnel in the correct procedures to be used for casualties involving the engineroom. It will be your responsibility to see that personnel under your

supervision learn about the capabilities and limitations of the equipment with which they work, and the procedures to follow should casualties occur.

Safety is a responsibility of all Navy personnel. As an EN1 or ENC, you will instruct your personnel in shipboard safety precautions, particularly those that are applicable to your division, and will ensure that copies of these precautions are posted in conspicuous places. Most importantly, you will watch for careless methods of work—the frequent source of accidents. You will be expected to set a good example for following safety practices. The example you will set will have a great influence on your people and other personnel. You will watch for and report all unsafe conditions.

To successfully perform your duties, you should know the duties performed in other divisions, and how the various shops can help you get a job done. While it is true that many maintenance and repair jobs occurring in your own division can be properly handled from start to finish without the aid of any outside rating, other jobs may be more extensive and may require special skills or equipment not available within your division. Although you and the personnel under your supervision may be able to do the bulk of the work, certain portions of a job may require the skill of an Electrician's Mate, a Machinist's Mate, a Machinery Repairman, a Hull Maintenance Technician, or people in other ratings. Therefore, you must know what equipment is used by other ratings in the engineering department, and what kind of work can be done with that equipment. Familiarize yourself with the work performed and equipment used in other divisions by observing them at work and by talking to leading petty officers in other ratings. There is no excuse for using unskilled personnel and unsatisfactory procedures when the skill of other ratings and the equipment they use are already available.

WATCH DUTIES AND RESPONSIBILITIES

As a first class or chief petty officer aboard ship, you may be required to assist the division officer in organizing, supervising, and instructing other personnel in their military duties as well as

in their specialties. This duty includes assisting in the assignment of watch stations and other duties.

Every watch in the engineering department is a vital part of the ship's maintenance and operation program. The engineer officer is responsible for the operation and maintenance of the main engines and auxiliary machinery. However, the EN1s or ENCs and the personnel they supervise on the various watches actually do most of the work. Therefore, it is very important that the petty officers in charge learn and understand the extent of their responsibility to the engineer officer.

Engineering Officer of the Watch

The following excerpts from chapter 10 of *Navy Regulations* describe some of the duties of the officer of the engineroom watch:

“Status, Authority, and Responsibility. The engineering officer of the watch is the officer on watch in charge of the main propulsion plant of the ship, and of the associated auxiliaries. He shall be responsible for the safe and proper operation of such units, and for the performance of the duties prescribed in these regulations and by other competent authority.”

“Directing and Relieving the Engineering Officer of the Watch. The engineer officer, or in his absence, the main propulsion assistant may direct the engineering officer of the watch concerning the duties of the watch, or may assume charge of the watch, and shall do so should it, in his judgment, be necessary.”

“Relation with the Officer of the Deck. The engineering officer of the watch shall ensure that all orders received from the officer of the deck are promptly and properly executed. He shall not permit the main engines to be turned except as authorized or ordered by the officer of the deck.”

“Reports by the Engineering Officer of the Watch. The engineering officer of the watch shall report promptly to the officer of the deck and the engineer officer any actual or probable derangement of machinery, boilers, or auxiliaries which may affect the proper operation of the ship.”

“Reports to the Engineering Officer of the Watch. The engineering officer of the watch shall be promptly informed of any engineering work or change in disposition of machinery which may affect the proper operation of the plant or endanger personnel, or which is required for entry in the record of his watch.”

“Inspection and Operation of Machinery. The engineering officer of the watch shall cause frequent inspections to be made of the engines, boilers, and their auxiliaries; and shall ensure that prescribed tests, methods of operation, and instructions pertaining to the safety of personnel and material are strictly observed.”

“Records and Logs. The engineering officer of the watch shall ensure that the engineering log, engineer’s bell book, and prescribed operating records are properly kept. On being relieved, he shall sign the engineering log and the engineer’s bell book for that watch.”

Engineering Department Duty Officer

In ships not underway, the commanding officer may authorize the standing of a day’s duty in lieu of the continuous watch of the engineering officer of the watch. When authorized, the duties of the engineering officer, of the watch are assigned in port to the engineering department duty officer. However, when not at the station of the engineering officer of the watch, the duty officer must always be ready for duty the moment he/she is summoned or notified that his/her presence is required. The engineering

department duty officer, assigned by the engineer officer, must be a qualified engineering officer of the watch. On some ships, chief petty officers may be assigned as the engineering department duty officer.

In the temporary absence of the engineer officer, the duties of the engineer officer may be performed by the engineering department duty officer. If the engineer officer is on board, the duty officer reports the condition of the department to him/her prior to the eight o’clock reports. In the absence of the engineer officer, the duty officer makes the eight o’clock reports for the department to the executive officer (or command duty officer).

The engineering duty officer, in addition to such other duties as may be properly assigned to him/her, is responsible for:

1. The alertness and proper performance of all personnel of the engineering watches.
2. The safe and economical operation of all engineering machinery and systems in use.
3. The elimination of fire and flooding hazards and the prevention of sabotage.
4. The security of all engineering spaces. In order to determine the actual conditions that exist in the engineering space and to evaluate the performance of watch personnel, the duty officer must make frequent inspections of the engineering spaces.
5. The proper maintenance of all machinery operating logs, and for writing and signing the engineering log for the period he/she is on duty.

The engineering department duty officer makes reports in the same manner as the engineering officer of the watch, except that when acting in place of the engineer officer, he/she is responsible for making the reports required of that officer. Engineering watch supervisors and the duty petty officers of the engineering divisions report to the duty officer during the performance of their duties.

A chief petty officer who is a qualified engineroom watch supervisor underway may be assigned a watch as the engineering department duty chief petty officer to assist the engineering department duty officer. The duty chief petty officer is normally assigned duty for the same

period as the duty officer, and reports to that officer.

Standing Watches

As a watchstander, you will be the “eyes” of the engineering department. You will be responsible for the orderly appearance and cleanliness of your assigned station. Prior to standing watch, you should thoroughly inspect all existing conditions, such as the operating condition of machinery and firefighting equipment. You should also check your assigned area for leaks and potential fire hazards. If a casualty occurs, you should take immediate steps to control it, as well as promptly notify the proper authority.

While on watch, you should strictly observe all operating instructions, regulations, and safety precautions. You should never leave your station unless you have permission from proper authority to do so, or are properly relieved. You should promptly execute all standing or special orders. When relieved, you should pass on to the relieving watch all information concerning existing conditions and special orders.

There are several watches that you may stand or for which you may be responsible. The stations and duties of some of the watches commonly stood by Enginemen are discussed in the following paragraphs.

ENGINEROOM AUXILIARY WATCH.—Auxiliary watches are maintained underway and in port to supply light, power, steam, and other services. The engine room auxiliary watch maintained in port includes a petty officer in charge and one or more Firemen. The petty officer in charge is responsible for seeing that an efficient and economical watch is being stood. All machinery not in operation must be checked to see that it has been properly secured.

The petty officer in charge of the auxiliary watch is responsible for the proper operation of the ship’s service generator and associated machinery; however, the operation of the electrical equipment is the responsibility of an Electrician’s Mate. The petty officer in charge checks to see that all operating machinery is lubricated as prescribed by the operating instructions. He/she makes sure that the fire and flushing pumps are inspected for satisfactory operation

and that the prescribed pressure is maintained in the firemain.

Except in emergencies, the engine room auxiliary watch does not make any changes such as stopping, starting, or shifting ship’s service generators without first notifying the Electrician’s Mate and the petty officer in charge of the watch.

A watch going off duty will not be considered relieved until the floor plates are wiped, the engine room is clean, all operating logs and records are correct, and information concerning the status of the machinery in operation, orders, special orders, and non-completed orders have been given to the relief.

COLD-IRON WATCHES.—Under certain prescribed conditions (such as when a ship moves alongside a repair ship or tender, or into a naval shipyard, and is receiving power from these activities) a security and fire watch is usually set by each division. This security watch is commonly known as a cold-iron watch. Each cold-iron watch makes frequent inspections of the assigned area and checks for fire hazards, flooding, or other unusual conditions throughout the area. The cold-iron watch keeps bilges reasonably free of water in accordance with applicable instructions. Hourly reports on existing conditions are made to the officer of the deck.

All unusual conditions are immediately reported to the officer of the deck and to the engineering duty officer, so that the proper division or department can be notified to take the necessary corrective measures. When welding or burning is to be performed in the area, the cold-iron watch checks to see that a fire watch is stationed.

If the ship is in drydock, the watch must check all sea valves, after working hours, to see that the valves are secured or blanked off. The watch must make sure that oil or water is not being pumped into the drydock and that weights such as fuel oil, feedwater, or potable water are not shifted without permission of the engineer officer.

DUTY ASSIGNMENTS

As an Engineman, you will be assigned duty aboard various types of ships, ranging from aircraft carriers to the smallest of river patrol boats. You will also be assigned shore duty. Your specific

duties will depend on the type and size of ship or station to which you will be assigned.

Aboard an aircraft carrier or a cruiser, you may be assigned to the “A” division. As a member of the “A” gang, you will be responsible for a wide variety of tasks including the operation, maintenance and repair of internal combustion engines, and the operation and maintenance of auxiliary, refrigeration, and air conditioning equipment.

On diesel-driven ships, you may be assigned to the “M” division or the “A” division. Your responsibility will vary depending on the size of the ship. You may have charge of one of the engineering spaces or the “A” gang and, on some small ships, you may act as the “M” division officer.

On a repair ship or tender, you may be assigned to the repair department. As an EN1 or ENC, you may be in charge of one of the repair shops such as the engine overhaul shop or the governor and fuel injector shop, or you may be in charge of one of the repair gangs. You may also be selected to attend Diesel Inspector’s school and become a Navy diesel engine inspector.

Duty at most shore stations will depend on your training and your field of specialization. You may also be assigned as an instructor either at one of the Engineman schools or at a recruit training station, or a canvasser recruiter. To qualify for instructor duty, you must successfully complete a course in instructor training.

As an Engineman, you may perform duty at the Naval Education and Training Program and Development Center, Pensacola, FL. Personnel assigned to this activity are involved in either the preparation of service-wide examinations for advancement or the preparation and revision of rate training manuals and other training materials.

SCOPE OF THIS TRAINING MANUAL

Before studying any book, it is a good idea to know the purpose and the scope of that book. Here are some things you should know about this training manual:

- It is designed to give you information on the occupational qualifications for advancement to EN1 and ENC.

- It must be satisfactorily completed before you can advance to EN1 or ENC, whether you are in the Regular Navy or in the Naval Reserve.

- It is NOT designed to give you information on the military requirements for advancement to PO1 or CPO. Rate training manuals that are specially prepared to give information on the military requirements are discussed in the section of this chapter that deals with sources of information.

- It is NOT designed to give you information that is related primarily to the qualifications for advancement to EN3 and EN2. Such information is given in *Engineman 3 & 2*, NAVED-TRA 10541 (current edition).

- The occupational qualifications that were used as a guide in the preparation of this training manual were those promulgated in the *Navy Enlisted Manpower and Personnel Classifications and Occupational Standards*, NAVPERS 18068-D (1981). Therefore, changes in the Engineman qualifications that may have occurred after the D edition became effective may not be reflected in the information given in this training manual.

- This training manual includes information that is related to both the knowledge and the Occupational Standards for advancement to EN1 and ENC. However, no training manual can take the place of actual on-the-job experience for developing skill in the practical factors. This training manual can help you understand some of the whys and wherefores, but you must combine knowledge with practical experience before you can develop the required skills. The *Personnel Advancement Requirement*, NAVPERS 1414/4, should be utilized in conjunction with this training manual whenever possible.

- Subsequent chapters in this training manual deal with the technical subject matter of the Engineman rating. Before studying these chapters, study the table of contents and note the arrangement of information. You will find it helpful to get an overall view of the organization of this training manual before you start to study it.

SOURCES OF INFORMATION

It is very important for you to have an extensive knowledge of the references to consult for detailed, authoritative, up-to-date information on all subjects related to the military requirements and to the occupational qualifications of the Engineman rating.

Some of the publications discussed here are subject to change or revision from time to time—some at regular intervals, others as the need arises. When using any publication that is subject to change or revision, be sure you have the latest edition. When using any publication that is kept current by means of changes, be sure you have a copy in which all official changes have been entered.

NAVAL EDUCATION AND TRAINING (NAVEDTRA) PUBLICATIONS

Originally, training manuals were developed by the Chief of Naval Training and carried the designation NAVTRA followed by a number. In 1973, the Naval Education and Training Production Development Center (NETPDC) came directly under the command of the Chief of Naval Education and Training (CNET). Training materials published by NETPDC after the above date are designated NAVEDTRA in lieu of NAVTRA; however, the numbers remain as originally assigned for most publications. The designators of publications printed prior to 1973 will be changed as each publication is revised.

The naval training publications described here include some which are absolutely essential for anyone seeking advancement and some which, although not essential, are extremely helpful.

NAVEDTRA 10052

The *Bibliography for Advancement Examination Study*, NAVEDTRA 10052 is a very important publication for anyone preparing for advancement. This publication lists required and recommended rate training manuals and other reference material to be used by personnel working for advancement. NAVEDTRA 10052 is revised and issued once each year by the Naval Education Training and Program Development

Center. Each revised edition is identified by a letter following the NAVEDTRA number. When using this publication, be SURE you have the most recent edition.

In NAVEDTRA 10052, the required and recommended references are listed by pay grade level. It is important to remember that you are responsible for all references used at lower levels, as well as those listed for the pay grade to which you are seeking advancement.

Rate training manuals that are marked with an asterisk (*) in NAVEDTRA 10052 are MANDATORY at the indicated levels. A mandatory training manual may be completed by (1) passing the appropriate Enlisted Correspondence Course based on the mandatory training manual, (2) passing locally prepared tests based on the information given in the mandatory training manual, or (3) in some cases, successfully graduating from an appropriate Navy school.

It is important to note that all references, whether mandatory or recommended, listed in NAVEDTRA 10052, may be expected to be used as source material for the written examinations at the appropriate levels. In addition, references listed in a rate training manual may also be used as source material for examination questions.

Rate Training Manuals

Most rate training manuals are written for the specific purpose of helping personnel prepare for advancement. Some manuals are general in nature and are intended for use by more than one rating; others (such as this one) are specific to a particular rating.

Rate training manuals are revised from time to time to bring them up to date. The revision of a rate training manual is identified by a letter following the NAVEDTRA number. You can tell whether or not a rate training manual you are using is the latest edition by checking the NAVEDTRA number and the letter following it in the most recent edition of the *List of Training Manuals and Correspondence Courses*, NAVEDTRA 10061 (revised).

There are three rate training manuals that are specially prepared to present information on the

military requirements for advancement. These manuals are:

Basic Military Requirements, NAVEDTRA 10054 (current edition)

Military Requirements for Petty Officer 3 & 2, NAVEDTRA 10056 (current edition)

Military Requirements for Petty Officer 1 & C, NAVEDTRA 10057 (current edition)

Each of the military requirements manuals is mandatory at the indicated pay grade levels. In addition to giving information on the military requirements, these three books give a good deal of useful information on the enlisted rating structure; on how to prepare for advancement; on how to supervise, train, and lead other people; and on how to meet increasing responsibilities as you advance in rating.

Some of the rate training manuals that may be useful to you when you are preparing to meet the occupational qualifications for advancement are discussed briefly in the following paragraphs.

Tools and Their Uses, NAVEDTRA 10085 (current edition), contains a good deal of useful information on the care and use of all types of handtools and portable power tools commonly used in the Navy.

Blueprint Reading and Sketching, NAVEDTRA 10077 (current edition), chapters 1 through 4 and chapter 7, recommended reading in preparing for advancement to EN2. The remainder of the training manual contains additional information that may be of value to you as you prepare for advancement to EN1 and ENC.

Mathematics, Vol. 1, NAVEDTRA 10069 (current edition), and *Mathematics, Vol. 2*, NAVEDTRA 10071 (current edition), may be helpful if you need to brush up on your mathematics. Volume 1 contains basic information that is needed for using formulas and for making simple computations. Volume 2 contains more advanced information than you will need for most purposes. However, occasionally, you may find the information in this book to be helpful.

Engineman 3 & 2, NAVEDTRA 10541 (current edition), must be satisfactorily completed for advancement to EN3 and EN2. If you have met this requirement by satisfactorily completing earlier editions of training manuals prepared for Enginemen, you should at least become familiar with *Engineman 3 & 2*, NAVEDTRA 10541 (current edition). Much of the information given in this edition of *Engineman 1 & C* is based on the assumption that you are familiar with the contents of *Engineman 3 & 2*, NAVEDTRA 10541 (current edition).

Rate training manuals prepared for other Group VII (Engineering and Hull) ratings are often a useful source of information. Reference to these training manuals will broaden your knowledge of the duties and skills of other personnel in the engineering department. The training manuals prepared for Machinist's Mates, Boiler Technicians, and Machinery Repairmen are likely to be of particular interest to you.

For a complete listing of rate training manuals, consult the *List of Training Manuals and Correspondence Courses*, NAVEDTRA 10061 (latest revision).

Correspondence Courses

Most rate training manuals and officer texts are used as the basis for correspondence courses. Credit for the completion of a mandatory training manual is earned by passing the correspondence course that is based on that training manual. You will find it helpful to take other correspondence courses, as well as those that are based on mandatory training manuals. A correspondence course helps you to master the information given in the training manual or text. It also gives you a good idea of how much you have learned.

NAVSEA PUBLICATIONS

A number of publications issued by the Naval Sea Systems Command (NAVSEA) will be of interest to you. While you do not need to know everything that is given in the publications mentioned here, you should have a general idea of where to find information in NAVSEA publications.

The *Naval Ships' Technical Manual* is a basic doctrine publication of NAVSEA. To allow the ship to distribute copies to the working spaces where information is required, chapters are now issued as separate paper-bound volumes. Chapters are kept up to date by means of yearly revisions. Chapters are reviewed less frequently where yearly revisions are not necessary. In chapters where intra-year changes are required, either an intra-year edition or a NAVSEA Notice is distributed as a temporary supplement for use pending issue of the new edition of the chapter.

You will find chapters in *Naval Ships' Technical Manual* of particular importance to the Engineman referenced in this training manual. For a list of all chapters in the manual, see appendix A, chapter 001.

The *Deck Plate* is a monthly publication which contains interesting and useful information on all aspects of shipboard engineering. This magazine is particularly useful because it presents information which supplements and clarifies information contained in the *Naval Ships' Technical Manual* and because it presents information on new equipment, policies, and procedures.

Manufacturers' technical manuals that are furnished with most machinery units and many types of equipment are valuable sources of information

on operation, maintenance, and repair of machinery and equipment. The manufacturers' technical manuals for internal combustion engines and associated equipment are usually given NAVSEA numbers.

TRAINING FILMS

Training films which are available to naval personnel are a valuable source of supplementary information on many technical subjects. Films that may be of interest to you are listed in the *Department of the Navy Catalog of Audiovisual Production Products*, OPNAVINST 3 157.1.

When selecting a film, note its date of issue in the film catalog. As you know, procedures sometimes change rapidly. Thus some films become obsolete rapidly. If a film is obsolete only in part, it may sometimes be shown effectively if before or during its showing you carefully point out to trainees the procedures that have changed. When you plan to show a film to train personnel, take a look at it in advance if possible so that you may spot material that may have become obsolete, then verify current procedures by looking them up in the appropriate sources before showing the film.